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ABSTRACT

The history of instructional television, the development of the telecourse concept, current uses of instructional television, economic factors, and cooperative arrangements are considered. After the initial approach of presenting a professor lecturing as if before a class, producers of instructional television began to dramatize the subject, adopt a documentary format, and eventually, develop the telecourse concept. Telecourses combine often-sophisticated television programs with related printed materials. Telecourses are either produced for instruction or produced originally for a general audience but have suitable content and quality for instructional purposes. Currently, colleges and universities make extensive use of on-campus, closed-circuit television systems for instruction; however, few direct substantial effort to broadcasting instructional television to off-campus audiences. Some barriers to greater use of instructional television by four-year institutions are identified. The following developments in video technology are covered: satellite transmission systems, cable television systems, narrowcast technology, instructional television fixed service, and videocassettes and videodiscs. It is suggested that 70 percent of the costs of instructional television are associated with acquiring and modifying the instructional materials and providing programs, while 30 percent of the total costs are for institutional support services. Consortia are a means to produce high-quality programs or to arrange for more efficient use of available telecourses. A bibliography and a list of organizations involved in developing the field of instructional television or providing information on it are included. (SW)

Instructional television—Higher education without commercial interruption

Carol Herrnstadt Shulman

Instructional television is emerging as a potentially important tool for reaching student audiences in postsecondary education. In 1978-79, more than 1,800 colleges and universities used television for instruction, and 735 institutions offered complete courses over television. Some 6,884 courses were offered, enrolling nearly half a million students (Higher Education Utilization Study 1979).

But these figures are small compared to the audiences that instructional television's supporters believe can be reached. Thus, the audience could be as large as 64 million—the total high school graduate population over 25 years of age that has not completed college. Of this group, 6 million are in college and an additional 12 million have taken some college but currently are not enrolled. Instructional television is particularly appropriate for the individuals in this population who are highly motivated learners and have good basic learning skills.* Most often, persons with these characteristics are mature adults (Zigerell 1979). As this segment of the nation's population grows, colleges and universities are taking an increased interest in programs directed to these prospective students. Such interest combines with new technologies, new course materials, and new cooperative arrangements among producers and users, to promote a growing use of instructional television.

History of instructional television

Current interest in instructional television recalls its early heyday during the 1950s when 114 colleges and universities teamed up with television stations to present televised college lectures (Carlisle 1974). From this optimistic beginning, instructional television fell into a decline, leaving only a few survivors such as CBS-TV's "Sunrise Semester" and the City Colleges of Chicago's TV College.

The reasons for the disappearance of much of this programming are instructive. First, before the advent of videotape, television programs were broadcast live and stations provided studio time for instructional television only at hours inconvenient for potential students. Videotape provides greater flexibility in determining when courses may be offered. Second, even when good broadcasting time was available, there often was not enough courseware produced to attract students interested in courses for credit. And third, producers overestimated the potential student audience in a given geographic region and did not realize that long-term instructional programming must draw from a heavily populated region in order to net a sufficiently large student audience (Zigerell 1979).

As an example of successful instructional television, Chicago's TV College overcame these problems and boosted its popularity in other ways. It provided a real off-campus alternative for the Chicago-area population, enabling persistent students to build substantial credit towards or even complete an associate of arts degree. It also wisely recognized that a course should be offered at spaced intervals rather than in successive terms to prevent enrollments from dropping precipitously from one term to the next (Zigerell 1979).

The instructional television of the 1950s and 1960s might not appeal to today's more sophisticated television audiences. The "talking head" approach dominated television courses, presenting a professor lecturing as if before a class. Gradually, however, producers began to use the medium more effectively by providing dramatizations of the subject, adopting a documentary format, and eventually, developing the telecourse concept (Zigerell 1979).

Telecourses

The telecourse represents the most recent stage in the evolution of instructional television, and it is rapidly becoming the dominant mode in the field. Telecourses combine often-sophisticated television programs with related printed materials to produce a unique educational experience:

> a telecourse "is an examination and presentation of a body of knowledge and information through the use of sight, sound, color, movement, and print in a manner designed to stimulate and increase involvement and clarity and quantify a carefully designed and validated series of learning objectives." (Mittelstet 1979 quoting Gripp)

Telecourses may originate either as "courses for television" or as "courses from television," also called "wrap-around courses" (Munshi 1980). In the first instance, the telecourse is produced for instruction and is typically on a standard academic subject such as government or biology. The user institution arranges for rental, lease, or purchase of the course and for broadcast time, which usually is not during prime time. Printed materials are developed in conjunction with the video component. In contrast, the "wrap-around" course is a television series that was produced originally for a general audience and was broadcast during prime time on either a commercial or a Public Broadcasting System station. Its content and academic quality, however, make it suitable for instructional purposes. Therefore, printed course material is developed around the original program (Munshi 1980). In either instance, the telecourse is usually about 15 hours long, either as 30 half-hour segments or as 13 to 15 one-hour segments.

Although the television program is at the heart of the telecourse concept, printed materials and other educational activities also are essential. The basic complement to the video program is the study guide, which provides the student with learning objectives for each program and for the entire course. The study guide also includes self-graded pretests, study questions for the television program and for reading assignments, enrichment activities (required and optional), and self-graded or mail-back graded posttests (Mittelstet 1979; Munshi 1980).

Campus liaison is necessary in the telecourse concept. The extent of student-faculty relations depends on how the individual institution decides to organize and administer the telecourse.

*Peter J. Dirr (projects manager, Educational Activities, Corporation for Public Broadcasting) December 9, 1980; conversation with author.

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Contact may be limited to a final exam but usually includes other graded tests as well as several optional review sessions on campus or in a community location. In addition, many institutions arrange for telephone contact or on-campus meetings with faculty overseeing the course (Mittelstet 1979).

Other telecourse components vary according to the demands of the subject and the complexity of the telecourse design. They may include a textbook, required and optional readings, and learning activities such as an optional museum visit for a course on the arts or required on-campus and mail-in compositions for an English composition telecourse (Mittlestet 1979). One experienced producer of telecourses notes that "the curriculum and materials must provide a flexible framework around which faculty members are free to add or revise study materials" (Gross 1978a, p. 10, quoting Bousma).

Current uses of instructional television

Colleges and universities make extensive use of on-campus, closed-circuit television systems for instruction (Higher Education Utilization Study 1979). However, few direct substantial effort to broadcasting instructional television to off-campus audiences. Colleges and universities generally are not taking advantage of the new developments in technology and programming that can reach adult audiences who are unable or reluctant to come to campus for instruction. This conclusion applies more to four-year institutions than to the two-year colleges:

> forty-one percent of all four year public institutions which use TV for instruction rely solely or primarily on closed circuit systems. Those institutions generated seventy-six percent of the TV course enrollments reported by four-year public colleges. On the other hand, ... sixty-five percent of the total enrollments [in television courses] were generated by two-year colleges which work solely or primarily with public TV stations. (Higher Education Utilization Study 1979, p. 20)

Four-year institutions fail to make more effective use of off-campus instructional television for two principal reasons: lack of respect for such instructional methods and lack of institutional support. In the first instance, faculty, administrators, and students believe that television for off-campus instruction provides "education inferior in quality to that provided by traditional on-campus programs" (Hershfield 1980, p. 48). Surveys taken in 1979 of public and private four-year institutions asked whether faculty members were or were not supportive of the use of television for instruction. (The survey results did not distinguish between on- and off-campus instructional television.) In the public sector 40 percent of the respondents cited lack of faculty support as a factor preventing the use of instructional television, and 33 percent in the private sector concurred (Dirr and Pedone 1979a and b). With regard to institutional support, the 1979 surveys showed that lack of such support services as faculty contact, flexible registration procedures, was equally a hindrance in the use of television (Dirr and Pecone 1979a and b).

These barriers to greater use of instructional television are inherent in the current system of course development and course financing that dominates four-year institutions (Hershfield 1980). Traditional methods of course development involve one faculty member devising a course, often while teaching it. The salary for the course development and the teaching salary are one and the same. In contrast, production of a sophisticated instructional television course involves long-range planning, team production, and a substantial capital outlay. Most institutions are not geared up for this type of enterprise (Hershfield 1980).

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Video technology

Rapid developments in video technology cause telecommunications observers to believe that a "communications revolution" will occur in this country over the next ten years (Bonham 1980a, p. 2; Smith 1978a). One factor in this revolution is the increasingly greater flexibility in the delivery of video programs. That is, new satellite transmission systems, expansion of cable systems, and new home video systems provide the public with more opportunities for home viewing.

Satellites. Satellite transmission systems hold the key to the development of the communications revolution. These satellites

> provide a means of transmitting signals across great distances, obviating the need for complex systems of terrestrial microwave and/or wire relays. Thus, they greatly decrease the cost of both long-distance transmission, and transmission from a single source to many receiving sources spread over a large geographic area. (Smith 1978a, p. 10)

This great advantage is becoming recognized. In 1974 there were only a few cable television systems, linked together by terrestrial microwave. By 1979, more than 2,000 cable systems were participating in a satellite-interconnected network (Mahoney, DeMartino, and Stengel 1980).

For instructional television, the satellite transmission to cable networks can be a real boon. For example, the Appalachian Community Service Network (ACSN), which provides instructional television programming, can serve any cable system in the country via satellite and currently serves 50 systems, more than half of which are in the Appalachian region. ACSN now has about 500,000 subscribers and plans for rapid development of its system.*

Narrowcast technology. Narrowcast technologies provide for a variety of methods for the interested learner to gain access to instructional television. "Narrowcast" refers to the transmission of a television signal from a transmitting station to a limited number of receivers. (In contrast, broadcast transmissions go to an unlimited number of receivers.) Cable television, instructional television fixed service, and videodiscs and cassettes are examples of narrowcasting. These technologies may make the production of instructional programs for specific groups of learners more economically feasible. For example:

> A market audience of 100,000 people who wish to take a videodisk course on psychology ... would more than pay for itself, remembering that ... under conditions of high-cost open television, half a million Americans take public television courses for credit. (Bonham 1980b, pp. 35-36)

Cable television. With cable television, the television signal is disseminated by wire instead of over the air. A cable system may contain more than 100 channels. Cable companies are granted franchises by local governments to wire their communities and deliver programming. Currently, there are about 4,000 cable systems serving 9,000 communities and 40 million people (Baltzer 1980).

Originally intended to provide a better reception and choice of channels in rural areas, cable television is rapidly moving into urban areas (Smith 1978b). This development is significant for instructional television since urban locations provide new opportunities for reaching large audiences via cable. Further, most cable franchises stipulate that the cable system must provide for educational access.** The number of channels available on cable affords multiple opportunities for instructional television. In addition, cable television may encourage "participation by colleges and universities in creating and producing programs designed for the social, cultural, civic, business, and industrial

needs of their community" (Smith 1978b, p. 16). Analysts project that by 1985 cable television will have about 450,000 education subscribers (Bonham 1980b).

Instructional television fixed service. Under a Federal Communications Commission (FCC) ruling, 28 channels have been set aside in the microwave part of the electromagnetic spectrum for educational institutions' use. These 28 channels are known as instructional television fixed service (ITFS). An individual institution may obtain an ITFS license from the FCC to operate up to four video channels plus audio channels to allow two-way communication.

The microwave frequency extends for only about 25 miles, so the FCC may assign the same channel to geographically separate institutions around the country (Smith 1978b).

Institutions holding ITFS licenses may transmit television programs to predetermined reception points in the community, such as industrial sites, hospitals, or schools. The two principal advantages of ITFS are its multi-channel capacity, which makes it possible to transmit several programs simultaneously, and its interactive capability. Viewers of an ITFS program can respond to a presentation by pressing a response button that sends their message to the transmission point (Baltzer 1980). The University of Southern California, for example, has an interactive instructional program that transmits live courses on campus to industrial facilities in the Los Angeles area. Students at these sites, usually company conference rooms, respond to the instructor and to their fellow students on campus by ITFS or teleconferencing. A daily courier service delivers class material and homework (Baltzer 1980).

Videocassettes and videodiscs. Personal video systems made possible by the advent of videocassettes and videodiscs offer new opportunities for individualized instruction. Home videocassette player/recorders have been on the market for several years and a large number of movies and programs, as well as professional development courses in several fields, are available on videocassette. Videodiscs are a newer development—thin plastic discs that use a special player. According to projections, 10 percent of the television households in America will own videodisc or videocassette equipment by 1985 (Mahoney, DeMartino, and Stengel 1980).

These technologies bring instructional television to the individual level, as students learn to use videocassettes and discs on their own time schedule, as they would books, rather than remain tied to a broadcast schedule (Rice 1980). In addition, this individualized approach

> will ultimately mean viability for programs that satisfy more highly specialized interests and tastes than any other national programming medium. As with today's audio recordings, the home video market allows thousands rather than tens of millions of viewers to be targeted with programming. (Mahoney, DeMartino, and Stengel 1980)

Economic factors

The cost structure for telecourse instruction differs significantly from that of traditional on-campus instruction. About 70 percent of the costs of instructional television are associated with acquiring and modifying the instructional materials and providing programs. Approximately half of this amount—35 percent of the total costs—goes for air time and faculty salaries. Institutional support services make up the final 30 percent of total costs.

With traditional instruction, however, faculty salaries account for 45 percent of the total costs, while only about 5 percent goes for instructional materials. The other 50 percent of costs is for institutional support services (McCabe 1979).

Thus, enrollment is the key in determining how expensive telecourse instruction will be:

> In traditional instruction the enrollment in any course, beyond some minimum, is not critical. Each enrollment results in a similar cost, as sections are added or cancelled, based on an expected mean class size. In television-centered programs enrollment is of central concern, as most of the expenditures are committed regardless of enrollment, and each enrollment adds very little cost. (McCabe 1979, pp. 30-31)

Therefore, to make the cost of an instructional television course comparable with the cost of a traditional course, the former must have a much larger enrollment.

Hershfield (1980) analyzes the cost differences between producing a high-technology course and a traditional course. The high-technology course involves the development of videocassettes, audiocassettes, and sophisticated written materials, and costs about $54,000 per year over a five-year period, excluding faculty salaries. (Five years is considered the useful life of a high-technology course.) A traditional course, on the other hand, costs about $21,000 per year in faculty salary. Hershfield concludes that to make credit-hour costs equal between the two courses would require that the high-technology course enroll 2,333 students over the five years, compared to the 600 students typically taught in a traditional course over the same period.

To recoup the high production costs, then, an institution producing a telecourse needs to go beyond its own campus and lease the telecourse to other institutions (McCabe 1979). For example, a sociology course now in production for the Dallas County Community College District will cost about $350,000 to produce and needs an enrollment of about 4,500 to 5,000 in the District as well as leasing earnings to recover its costs over its five-year life. The District has succeeded in covering the expenses of similar courses and expects to meet the expenses of this course also.***

The leasing fees charged to user institutions vary depending on the broadcast delivery system, the type of videotape, and student enrollment. For one of its telecourses, Dallas County District charges a flat $6,000 or $2,750 plus $10 per student enrolled in the first semester of the course, if open broadcast delivery and two-inch videotape are used. The second-semester charge is $1,500 plus $10 per student enrolled, or a flat fee of $3,500.

In deciding whether to invest in leasing a telecourse, an institution has to weigh a host of cost factors, in addition to the leasing charges, against potential student enrollment. Some considerations are:

- Does the institution pay for air time?
- Does it have to generate enough income from tuition/FTE reimbursement to cover other than "out of pocket" expenses, if so, what is included?
- [Does it] have control over the tuition funds generated or do they go into the general fund of the state?
- Does it receive state or grant support in any form?
- How much does it pay faculty to teach telecourses?
- What is the competition in the immediate area for students? (Munshi 1980, p. 23)

Consortia

Colleges actively involved with telecourses may form consortia to produce high-quality programs or to arrange for more efficient use of the available telecourses. These consortia may be organized on an ad hoc basis to work on the development of a single

*David Buckingham (coordinator, Cable Operations, ACSN) January 5, 1981 conversation with author.

**Frank W. Norwood (executive secretary, Joint Council on Educational Telecommunications) January 5, 1981, conversation with author.

***Rodger Pool (director, Instructional Television, Dallas County Community College District) January 21, 1981, conversation with author.

telecourse or they may be permanent groups overseeing long-range development of the production or use of telecourse material.

From the production side, consortia offer attractive benefits to participating institutions. The cooperating institutions develop a course that meets their needs, guaranteeing a substantial market for the telecourse. Pooling resources makes available a larger budget for production, so that a high-quality course can be developed. And institutions involved in the consortia have free use of the telecourse (Gross 1978a).

One such collaborative effort several years ago produced a telecourse on American government. Four institutions participated: Dallas County Community College District (DCCCD), TV College in Chicago, Coast Community College in southern California, and Tarrant County Junior College District in Texas. DCCCD took the lead in this consortium, contributing 67 percent of the original budget, retaining complete control over the work, and providing the production staff. All institutions contributed a full-time faculty member for writing a course "narrative" from which the television script was produced, as well as a study guide, lessons, and tests (Gross 1978a).

The resulting telecourse provided a unique perspective on American government:

> "To accommodate requirements for study of state government that vary from state to state, the consortium members have incorporated a comparative approach to state government. . . . Content experts . . . were able to set up . . . case examples and interviews with key officials that would have been difficult for us to set up on our own. The result is a much richer, broader course in American federal and state government . . . than one which might have been produced with only local resources." (Gross 1978a, p. 2 quoting Mittelstet)

Consortial arrangements also are adopted by user institutions for purchasing telecourses. By pooling resources institutions are able to purchase more high-quality programs than any single institution could on its own (Gross 1978b; Hobbs 1980). But there are other advantages as well. Consortium members share expertise in selecting the programs and in developing study guides and other printed materials (Hobbs 1980). Moreover, by acting as a group, they have some influence over the development of telecourses, that is, they "can begin to prod producers of televised instruction towards better meeting their needs" (Gross 1978b, p. 26).

Conclusion

People in the higher education community who are knowledgeable about instructional television see the new video technology and developments in programming as evidence that instructional television will make great gains during the 1980s. They believe it may revolutionize how adults acquire access to postsecondary education. However, they see two major problems that may inhibit some institutions, especially four year colleges and universities, from actively participating in instructional television. First, the high initial costs of developing a telecourse may seem prohibitive to college administrators accustomed to more modest demands upon the college budget. However, increasing opportunities to lease courses from an expanding group of producers can significantly reduce the costs involved in telecourse instruction and should be considered a reasonable alternative.

A second barrier confronting instructional television is the reluctance of faculty to use the new technology. Often, faculty regard television for off-campus instruction as second-class (Hershfield 1980). Although attitudinal change often is difficult to achieve, some steps to encourage faculty approval of telecourses can and frequently are built into the telecourse system. Through the components of the telecourse (*e.g.*, study guide, tests, and faculty-student conferences), faculty have an opportunity to modify telecourse instruction to suit their perception of how the course should be taught.

Academic administrators and faculty need to investigate how instructional television may help them meet their institutional goals so that they can make a rational decision on whether they should use this approach. It is probable that if institutions fail to become involved in instructional television, private industry and new types of educational organizations will step in to provide educational television services to the adult population.

Information resources

Described below are several organizations involved in developing the field of instructional television or providing information on it.

■ Adult Learning Programming Department, Public Broadcasting System's Educational Telecommunications Program Service (PTV 3), 475 L'Enfant Plaza SW, Washington, D.C. 20024; Dee Brock, director. The Adult Learning Programming Department, established in July 1980, plans to make available programs to participating PBS stations and cooperating colleges. Three kinds of courses will be offered: college credit courses, informal learning courses and programs, and professional development and career training courses and programs. Participating institutions will assign the amount of credit to be awarded and provide for faculty-student liaison.

■ The Center for Learning and Telecommunications, American Association for Higher Education, One Dupont Circle, Suite 780, Washington, D.C. 20036; Marilyn Kressel, director. The Center assists postsecondary institutions in exploring the potential of technology-based programs. Projects include the synthesis and organization of information already available on telecommunications but currently scattered, a guide to major telecommunications models, and a handbook of alternative technologies.

■ Corporation for Public Broadcasting/Annenberg Higher Education Telecommunications Project, CPB, 1111 16th Street NW Washington, D.C. 20036. Under a 15-year, $150 million grant from Walter H. Annenberg, publisher of *TV Guide*, CPB is planning to produce college-level courses through existing and developing communications systems. The funds will be used to develop telecommunications materials and courses to be offered in cooperation with higher education institutions for undergraduate degree credit.

■ Joint Council on Educational Telecommunications, 1126 16th Street NW, Washington, D.C. 20036; Frank Norwood, executive secretary. The Council is an organization of nongovernmental associations designed to monitor and inform its members about current technologies that may affect opportunities for educational television.

■ National University Consortium for Telecommunication in Teaching, University of Maryland University College, College Park Maryland 20742; Allan Hershfield, executive director. Launched in 1980, the NUC plans to make a complete bachelor's degree program available to home-based adult students through television and the directed study learning system developed by the United Kingdom's Open University and the University of Maryland University College. To date, seven institutions are participating in the program, with broadcasts over ten local public television stations and two cable systems.

■ University of Mid-America, P.O. Box 82006, Lincoln, Nebraska 68501. Founded in the mid-1970s, the UMA is governed and administered by a consortium of 11 midwestern universities. It

has four objectives: to develop multi-media college-level courses for study at home; to conduct research on adult learning, evaluate learner response to open learning courses, and disseminate research results; to assist the consortium members in their development of open learning delivery systems; and to distribute course materials to institutions nationwide.

■ Wayne State University, University Studies/Weekend College Program, College of Lifelong Learning, Detroit, Michigan 48202. Since 1973, WSU has offered this program that is designed especially for employed persons and homemakers. One component of this program is a television program produced by WSU and broadcast daily over Detroit stations in half-hour segments and repeated in five program blocks every Sunday during the term. Other components include a workshop, a conference course, and directed study courses, seminars, and electives.

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